Complexity Theory as a Conceptual Construct for Understanding Client Change

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Introduction

Every "science begins as philosophy and ends as art; it arises in hypothesis and flows into achievement" (Durant, 1926, p. 2). This quote has particular import for the social work profession when considering the historic tensions between the broader pursuit of social justice within a community or organization and the targeted delivery of interventions to individuals, couples, or families (Gerber, 2007; Marx, 2004; Reamer, 1999). A prominent and fundamental feature of the social work profession at either tier, and the gaps between, is the commitment to understanding and effectuating *chang*e – a value-laden term that profoundly influences intervention frameworks and strategies, and the measurement of successful or unsuccessful outcomes (Ford & Urban, 1998; Reamer). For the social work profession, the epistemology of evidence-based practice [EBP] is, at its core, the application of *systematic* forms or structures to the scientific and clinical conceptualization of human change and adaption (Pollio, 2006).

The physical sciences have posited that organic and inorganic systems are never static, but exist on the edge of cooperation and turbulence at every level of adaption and re-organization (Butz, 1997). This phenomenon is identified in the literature as *complexity theory,* which provides a model for understanding the non-linear process by which diverse systems self-organize. The study and application of complexity theory to individual and organizational systems parallels the emphasis on EBP as a means of deconstructing the intersection between the effectiveness or efficacy of therapeutic interventions, the capacity for client change, and objective measures for that change (Pollio, 2006; Proctor & Rosen, 2008; Witkin & Harrison, 2001). An emphasis on EPB is not without its pitfalls precisely because positivist or reductionist concepts of evidence can potentially draw social workers toward linear cause and effect measures that may become so rigid as to neglect individual or cultural differences (Gambrill, 2007; Kirk & Reid, 2002; Pollio, 2006). For purposes of bridging this gap between intuition and induction or observation and deduction, however, social work educators and practitioners are conceptualizing the emerging science of complexity theory, rooted in biology and physics, as a paradigm for thinking about how individuals and organizations change through ever-evolving interactions and adaptions (Butz, 1997; Byrne, 1998; Halmi, 2003; Stevens & Cox, 2008).

Indeed, it is this quest for a theory of what and how institutions and individuals change that has driven the achievements of social work for a century (Aldarondo, 2007; Marx, 2004). The earliest components of the social work tradition, as brokered by Mary Richmond and her contemporaries in the early 20th century, encouraged transformative change in social and political systems, as well as individuals living within these vibrant, adaptive, and chaotic systems (O'Connor, 2001; Tyson, 1995; Wolf-Branigin, 2009). In the clinic and the field, social workers developed and applied theories of change like *imaginative sympathy*, *mindfulness*, *therapeutic alliance*, or some other means of metaphorically describing a moment when the exchange of information thereby transformed *an other* (Anderson & Gehart, 2007; Castonguay, Constantino, & Holtforth, 2006; Duncan, Miller, Coleman, Kelledy, & Kopp, 2000; Madsen, 1999).

What made Richmond's work so important, however, was that *valuing* change was not enough. If the social work profession accepts the maxim that theory drives practice then the

quest for empirical constructs that reveal and explain *patterns of change* within and through individual and organizational systems is the foundation for developing more scientific and ethical practices. Thus, professional social workers must understand and observe change within a scientific method that can be articulated and replicated (Padgett, 2009; Pollio, 2006; Tyson, 1995).

Complexity Theory and Social Work Practice

A few decades ago, the physical sciences undertook a transdisciplinary approach to exploring and understanding changes or adaptions that occur in nonlinear systems (Waldrop, 1992). Applying an eclectic array of knowledge from fields as diverse as physics and economics, this new science was labeled, though somewhat misleadingly, as *chaos theory*, from which evolved theories of *complexity*. For purposes of this paper, the distinctions are not as important as the common features: systems (individual or institutional) seek optimal stable states but these stable states are never static states (Butz, 1997; Byrne, 1998; Davies & Gribbin, 1992).

In complexity theory, individual and systemic change does not occur in isolation but is always relative to some other point in space and time. Complexity theory posits that the aggregation of these points may reveal *complex patterns* – even seemingly opaque ones – from which it is possible to measure visible changes and adaptions. The objective is to find observable patterns in ever changing environments, without assuming that all that appears chaotic or irrational is without explanation. Beinhocker (2006) aptly suggests that it is more productive to view human systems, in particular, as a "buzzing hive of dynamic activity, with no equilibrium [point of rest] in sight" (p. 19). Unlike some social scientists, when physical scientists "talk about a system's being dynamic," or changing over time what "they mean is that the state of the system at a current moment is a function of the state of the system at a previous moment, and some change in between the two moments" (p. 100). In dynamic systems, these changes (or adaptions) form *chains of relationships* or *feedback loops* which may prove an interesting means of thinking about iterations of choice as individuals and systems adapt and change. Although Beinhocker is discussing economics or market-based models, the social work profession has, for decades, considered various theories of change as a function of open and closed systems that are subject to feedback, outcomes, equilibrium, and homeostasis (Friedman, 1997).

The basic difference between the social work tradition of systems theory, and a more sophisticated understanding of complex systems as observable and measurable, is that complexity theory holds the potential for a more holistic and empirical conceptualization of change (Butz, 1997; Stevens & Cox, 2008; Woehle, 2007). This is plausible because the development of a social work science *specific to the act of change* nudges social work from narrow, linear notions of cause and effect (too often preoccupied with the "why" question or a motive-fault paradigm) to a "what" paradigm. What is observed? What patterns are revealed by iterative choices in opposition to another? This is an important and necessary shift in traditional social work research which is often based on experiments or surveys that are "snapshots in time, rather than continuously moving pictures" (Woehle, 2007, p. 150).

To be clear, an understanding of "what" is unlikely to be revealed through conventional theories of personality structure or the literal interpretation of client classification into psychiatric categories—most of which are scientifically indeterminate and inadequate as EBP for observing and measuring change (Gambrill, 2007). Stated another way, the non-linear range of client *choices* yields *sets* (plural) *of patterns* that occur within a beginning (intake), a middle

(intervention), and an end (termination). The objective is to observe these choices so as to allow a snapshot at each specific time horizon from which a form of reverse engineering may reveal feedback loops: initial condition (*a*) → change → imbalance → adaption → initial condition (*b*)…..initial condition(*c*).

Unlike the trajectory of a missile, of course, human behavior does not lend itself to a few linear equations. Fortunately, complexity theory presupposes that even if social scientists are unable to characterize all variables in a non-linear system completely, patterns of future preferences and self-organization may still be predictable given sufficient historical data and a matrix of observed outcomes (Heiby, 1995; Miller, 1999; Skar, 2004). To accomplish such a task requires the collection of time series data identifying disproportionate changes in parametric values, (bifurcation), sensitivity to initial conditions, and an irreversible hierarchal change, or self similarity (Heiby, 1995). These elements are important because "change" always means "change from what"? This question then underscores the proposition that complexity theory provides a theoretical rationale from which to identify initial or critical historical conditions and emergent adaptions by the client (Butz, 1997; Heiby, 1995). If these elements of change are then observable, measurements may be taken from a state of organization to other states of organization over various time horizons. Observation is possible because, like other non-linear systems, human systems possess spontaneous, self-organizing dynamics that may reveal identifiable patterns or, in another important scientific sense, networks (Taylor, 2001; Woehle, 2007).

Reflective Caveats

Social workers observe clients and organizations under stress, in stark conditions of uncertainty, and often in the environmental crucible of the judicial and mental health systems. Within a client's environment, the notion of change as a snapshot-in-time, a static event, or an "aha" moment is easy enough to nullify as a matter of logic. It is not so easy to do as a matter of professional training and habit. As Richmond reasoned nearly a century ago, a social worker in the field or in a chair must have a structure for observing and measuring change. How social workers thereby "think about" change influences how we observe and interpret what we see and feel so as to adjust our interventions accordingly. Given "properly specified initial conditions" insights into patterns of client choice enhance "the ability to understand the process of human changes, which is every bit as important, and deserves as much attention, as understanding specific interventions to promote change" (Warren, Franklin, & Streeter, 1998, p. 368).

Feelings and intuition are wonderful aspects of the art of social work but empirical science requires much more deliberate precision. There are two reasons for urging complexity theory as an emergent theory of client change in social work practice. First, observation and measurement requires an understanding of individuals, families, and institutions as coevolving systems that possess features of physical systems: initial conditions, changes, and adaptions. Second, these features are non-linear and occur in real time within the compression and uncertainty of conflict. As it relates to human beings, complexity theory is akin, but not metaphorically or scientifically the same, as the study of complex physical systems that occur in physics, chemistry, or biology.

Nevertheless, the social work profession must be careful to avoid the overbroad application of complexity theory or risk errors similar to proponents of EBP who interpret the success or failure of interventions only through that lens. For example, when researchers attempt to simplify causal relations by creating normal distributions through creative forms of statistics

and probability, the risk is that the privileged authority or economic power of the proponent buttresses a hypothesis that ignores how that knowledge is brokered and, thereby, encourages inappropriate interventions (Gambrill, 2007). As evidenced as well by too much of social science history, an even more irresponsible risk is to ignore cultural narratives unfamiliar to the observer or circumstances of oppression, disability, gender, or socio-economic disparity that may generate unethical assumptions (Kamya, 2007; Maxie, Arnold, & Stephenson, 2006; O'Connor, 2001; Tyson, 1995).

A Conceptual Conclusion

My own observation of clients during divorce or family dislocation yields the proposition that repeated choices (and chains or loops of those choices) often occur in an environment in which change may be assessed at two tiers: (1) a *behavioral* effect that alters the actions of each individual or pair of individuals and (2) an *hermeneutic* affect that changes the belief(s) each person has when acting in opposition to another. Whether or not the external or internal features of the human condition are predictable may be irrelevant to the existence of tangible and identifiable patterns that reveal adaption from an initial condition. Quite properly, there is a need for intellectual and ethical caution because any effort at measuring human change risks labeling the proponent as a reductionist, determinist, positivist, or reificationist (Pollio, 2006; Halmi, 2003).

Probable outcomes, not absolute certainties, require the social work profession to retain a modest approach toward the limits of empirically knowing another person or system. How to identify dynamic patterns by systematically collecting information relevant to the client remains the challenge for researchers and practitioners. How to do so without discarding the essential elements of social work as the delivery of ethical, humane change to another human life, implicates the complex tensions and relationships between authority and privilege (Anderson & Gehart, 2007).

Nevertheless, a science of complexity for social work has the potential for transdisciplinary development that is not solely related to the internal states of the client but assesses external, objective, historical facts that can be empirically verified by patterns of data, both primary and secondary. As the quote from Durant at the beginning of this paper succinctly suggests of science generally, modern complexity theory, as a *conceptualization* of the professional delivery of interventions by social workers, has the capacity to drive practice by blending the best of the art of theory and the science of social work practice.

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